REMARKS

Claims 1-21 are pending in this application.
Claims 1-21 are rejected.

In the Office Action dated 3 September 2002, claims 1, 9 and 21 are rejected under 35 USC §102(b) as being anticipated by Chausse et al. Claims 2-5, 10-14, 18 and 19-20 are rejected under 35 USC §103(a) as being unpatentable over Chausse et al. in view of Kalman et al. Claims 6-8 and 15-17 are rejected under 35 USC §103(a) as being unpatentable over the combination of Chausse et al., Kalman et al. and Ma et al. The '102 rejections are rendered moot by replacement claims 1 and 21 above. The '103 rejections are respectfully traversed.

Claim 1 has been amended to recite inverters having topologies based on on-off switches. Claim 1 has been further amended to recite a controller that operates a source-side inverter in current mode and a drive-side inverter in commutation mode to achieve sinusoidal input currents at an input of the source-side converter and sinusoidal output currents at an output of the driver-side inverter.

Chausse et al. do not disclose inverters based on on/off switches. They disclose phase delayed rectifiers (PDRs) Including thyristors.

The controller of Chausse et al. does not "operate" the drive-side inverter in commutation mode. Chausse et al.'s load-side PDR is used as an inverter. When a PDR is used as an inverter (load side), natural commutation occurs if the load has sufficient back emf. The commutation is initiated by the controller, but once initiated, the commutation is "uncontrolled " until one of the phase currents is

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reduced to zero. Chausse et al.'s controller intervenes at these low speeds, when there is no way for the inverter to self commutate (since the load must supply reactive power for the commutation process). Thus, at low speeds, the inverter is used to reduce the current in the dc link to zero before a new set of thyristors are selected.

Moreover, Chausse et al.'s source-side and drive-side PDRs do not generate sinusoidal currents at the input of the source-side PDR and the output of the drive-side PDR. Sinusoidal currents are not generated because a DC link inductor filters the current, which is reflected back to either the source or the load as a modified 120 degree square wave, replete with harmonics of the fundamental current of the load and source.

Thus Chausse et al. do not teach or suggest the apparatus of claim 1. Accordingly, claim 1 and its dependent claims 9-12 should be allowed over Chausse et al.

Replacement claim 21 recites apparatus comprising an ac motor; a first switch-based inverter having an input adapted to receive ac power; and a second switch-based inverter coupled to the ac motor. The apparatus further comprises means for operating the first inverter in current mode and the second inverter in commutation mode to achieve sinusoidal input currents at an input of the first inverter and sinusoidal output currents at an output of the second inverter. Replacement claim 21 should be allowable over the cited documents for the reasons above.

Claim 2 has been rewritten in independent form. Claim 2 recites that each modulating cycle is partitioned into a current mode Space Vector Modulation (SVM) portion and a current regulation portion. Chausse et al. don't teach or suggest This limitation. Nor do Kalman et al. Kalman et al. disclose only SVM for

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each modulating cycle. Moreover, Kalman et al. discuss SVM in connection with a voltage-sourced inverter, not a current-sourced inverter. Therefore, claim 2 and its dependent claims 3-8 should be allowed over the combination of Chausse et al. and Kalman et al.

Claim 13 recites a controller including a circuit for commanding a first inverter to perform current regulation on a dc current link during a first portion of each modulating cycle, and current mode space vector modulation during a second portion of each modulating cycle. The circuit also commands a second inverter to operate in commutation mode. As indicated above, none of the cited documents teaches or suggests that each modulating cycle is partitioned into a current mode SVM portion and a current regulation portion. Therefore, claim 13 and its dependent claims 14-20 should be allowed over the documents made of record.

A rejection under 35 USC §112, second paragraph, is respectfully traversed. The office action states that the first inverter should be renamed a converter, since the first inverter converts ac power to dc power. However, the distinction between inverter and converter is not so clear. In many topologies, an inverter can convert, and a converter can invert.

The application correctly uses the term inverter. Besides, using one term in the specification and a different term in the claims could cause confusion. To avoid this potential confusion, the '112 rejection should be withdrawn.

An added claims fee has been incurred, since the number of independent claims has been increased from three to four.

A petition for a one month extension of time is attached. The petition extends the period for response until January 3, 2003.

The examiner is respectfully requested to withdrawn the rejections of claims 1-21 and issue a notice of allowability. If any issues remain, the examiner is invited to contact the undersigned.

Respectfully submitted,

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I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office on December 26, 2002.

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. Power conversion apparatus comprising:

a source-side inverter including on/off switches;

a drive-side inverter including on/off switches;

a dc current link coupled between an output of the source-side inverter and an input of the drive-side inverter; and

a controller for operating the source-side inverter in current mode and the drive-side inverter in a commutation mode to achieve sinusoidal input currents at an input of the source-side inverter and sinusoidal output currents at an output of the driver-side inverter.

2. ~~The apparatus of claim 1, wherein~~Power conversion apparatus comprising:

a source-side inverter;

a drive-side inverter;

a dc current link coupled between an output of the source-side inverter and an input of the drive-side inverter; and

a controller for operating the source-side inverter in current mode and the drive-side inverter in a commutation mode, the controller ~~commands~~ commanding the source-side inverter to perform current regulation on the dc current link during a first portion of each modulating cycle and current mode space vector modulation during a second portion of each modulating cycle.

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21. Apparatus comprising:

an ac motor;

a first switch-based inverter having an input adapted to receive ac power;

a second switch-based inverter coupled to the ac motor; and

means for operating the first inverter in current mode and ; ~~and~~

~~means for operating~~ the second inverter in commutation mode to achieve sinusoidal input currents at an input of the first inverter and sinusoidal output currents at an output of the second inverter.

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